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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/862,688	05/22/2001	Dieter Maur	0275M-260DVB	9681
7590 11/18/2004				
Monte L. Falcoff Harness, Dickey & Pierce, P.L.C. P.O. Box 828 Bloomfield Hills, MI 48303		EXAMINER OMGBA, ESSAMA		
		ART UNIT PAPER NUMBER		
		3726		

DATE MAILED: 11/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/862,688

Applicant(s)

MAUER ET AL.

Examiner

Essama Omgba

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 July 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-77 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-11 is/are allowed.
- 6) ☒ Claim(s) 12,15,16 and 18-77 is/are rejected.
- 7) ☒ Claim(s) 13,14 and 17 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6/1/04, 8/19/04 & 9/17/04
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claim 31 is rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The limitation "the electrical control unit transmits an error signal if the transmission is always coupled to the electric motor" is not disclosed in the originally filed specification.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claim 31 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

It is not clear why the electrical control unit would transmit an error signal if the transmission is always coupled to the electric motor since the system is designed to operate with the transmission always coupled to the electric motor.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 12, 15, 20, 21, 50 and 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al. (US Patent 5,829,115) in view of IBEC (Body Assembly & Manufacturing, September 1994).

With regards to claims 12, 50 and 53, Speller, Jr. et al. discloses an electronic control system for use in a riveting process, the system comprising a rivet and a riveting machine, an electronic control unit 506, an electronic motor connected to the electronic control unit, wherein a force to be applied during the riveting process may be precisely computer-controlled, and the velocity of the electric motor is determined, a sensor 510 connected to the electronic control unit, the sensor operably detecting a riveting characteristic occurring during the riveting process, one of the riveting characteristics being the output shaft location, see column 4, lines 25-38, column 7, lines 20-67, column 8, lines 1-35 and 49-53, and column 9, lines 4-56. Although Speller, Jr. et al. does not specifically disclose two distinct sensors, however IBEC teaches an in-process monitoring used in an electrical self-piercing riveting process wherein process parameters such as joint thickness, applied force rivet shank length, force/velocity characteristic are continuously monitored during the riveting process, see pages 4, 5 and 7. Therefore it would have been obvious to one of ordinary skill in the art at the time

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the invention was made, to have used the monitoring system of IBEC in Speller, Jr. et al.'s electronic control system, in order to achieve superior rivet joints. Applicant should note that using a stationary die always aligned with the punch is an obvious matter of design choice wherein no stated problem is solved or unexpected results obtained in using a substantially stationary die versus the type taught by Speller, Jr. et al.

Furthermore many of the prior arts made of record in the instant application disclose the combination of a substantially stationary die always aligned with a punch. Also the transmission of Speller, Jr. et al. is always connected to the electric motor when the riveting machine is used.

For claim 15, see column 5, lines 23-29 and 49-64 of Speller, Jr. et al.

For claim 20, see column 7, lines 44-54 of Speller, Jr. et al.

For claim 21, see column 7, lines 20-25 of Speller, Jr. et al.

For claim 54, Applicant should note that the joint quality is monitored in the IBEC monitoring system, see page 5 particularly. It would have been obvious to one of ordinary skill in the art at the time the invention was made that a good quality joint will require among other things the head of the rivet being essentially flush with the punch-side workpiece outer surface without completely piercing through the die-side workpiece, see figure 15 of IBEC for example.

7. Claims 51 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al./IBEC as applied to claim 50 above, and further in view of Gast (US Patent 4,901,431).

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Speller, Jr. et al./IBEC discloses an electronic control system as shown above except for the electrical control unit stopping the riveting process and transmitting an error signal if an undesired condition exists. However such controls are old and well known in the art as attested by Gast, see column 17, lines 24-30 and 57-68 and column 18, lines 1-2. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated such electrical control unit with the system of Speller, Jr. et al./IBEC, in light of the teachings of Gast, in order to detect and resolve errors problem during the riveting process.

8. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al./IBEC as applied to claim 15 above, and further in view of Zeldman et al. (US Patent 3,878,734).

Speller, Jr. et al./IBEC discloses an electronic control system as shown above except for the transmission including a closed loop belt. However it is known to use closed belt loops in power transmissions as attested by Zeldman et al., see column 3, lines 34-36. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used a closed loop belt in the transmission of Speller, Jr. et al./IBEC, in light of the teachings of Zeldman et al., in order to provide a highly power transmission capable of being inexpensively manufactured.

9. Claims 22-30, 33, 34, 43, 44, 56, 57 and 59-61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al. in view of Cotterill (US Patent 5,752,305).

With regards to claims 22-26, 29, 30, 33, 34, 43, 44, 56 and 61, Speller, Jr. et al.

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discloses an electronic control system for use in a riveting process, the system comprising a rivet and a riveting machine, an electronic control unit, an electric motor connected to the electronic control unit and sensors connected to the electronic control unit and the electric motor, the sensors indicating various characteristics of the electric motor and various riveting characteristics, the electronic control unit being a programmable computer, see column 2, lines 24-31, column 7, lines 20-23 and 42-54 and column 8, lines 17-35. Speller, Jr. et al. does not disclose the rivet as being a self-piercing rivet operably driven by a punch as controlled by an electrical control unit, and a die operably diverging an end of the rivet without the rivet piercing completely through the exterior surface of a die-side workpiece adjacent the die, the die acting with a substantially relatively stationary die, the rivet being of a hollow and diverging type with a solid head. However Cotterill et al. teaches such rivet, punch and die assembling, see column 2, lines 27-49 and figures 1-3. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated the control system of Speller, Jr. et al. with the rivet and die system of Cotterill et al., in order to improve the riveted joint produced. Applicant should note that it is inherent that a data monitoring system is used with the system of Speller, Jr. et al. Also the transmission of Speller, Jr. et al. is always connected to the electric motor when the riveting machine is used.

For claim 27 and 28, Applicant should note that the position of the electric motor is an obvious matter of design choice.

For claim 57, Applicant should note that such system is conventional in the art.

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For claim 59, Applicant should note that circulating ball spindle used in a riveting machine transmission is old and well known to those of ordinary skill in the art.

For claim 60, Applicant should note that having the rotational axis of the motor to be offset from an elongated centerline of the plunger is an obvious matter of design choice.

10. Claims 31, 32, 35-42 and 45-47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al./Cotterill as applied to claims 22, 34 and 43 above, and further in view of Gast (US Patent 4,901,431).

For claims 31, 32, 41 and 42, Speller, Jr. et al./Cotterill discloses an electronic control system as shown above except for the electrical control unit stopping the riveting process and transmitting an error signal if an undesired condition exists. However such controls are old and well known in the art as attested by Gast, see column 17, lines 24-30 and 57-68 and column 18, lines 1-2. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated such electrical control unit with the system of Speller, Jr. et al./Cotterill, in light of the teachings of Gast, in order to detect and resolve errors problem during the riveting process.

With regards to claims 35-40, 45 and 46, Speller, Jr. et al./Cotterill et al. discloses an electronic control system as shown above except for a rivet feeder connected to the electronic control unit, a feed tube sensor wherein the rivet size is sensed by the sensor and an articulating robot attached to and positioning the riveting machine. However Gast teaches such rivet feeder and robot, see columns 13 and 14. Therefore it would

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have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated a rivet feeder and an articulating robot to the system of Speller, Jr. et al./Cotterill et al., in light of the teachings of Gast, in order to facilitate transfer of the rivet and enhance the rivet installation process.

For claim 47, the use of an endless belt is an obvious matter of design choice that is equivalent to Speller, Jr. et al.'s reduction gears mechanism.

11. Claim 48 is rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al. in view of IBEC and Gast.

Speller, Jr. et al. discloses an electronic control system for use in a riveting process, the system comprising a rivet and a riveting machine, an electronic control unit, an electric motor connected to the electronic control unit and sensors connected to the electronic control unit and the electric motor, the sensors indicating various characteristics of the electric motor and various riveting characteristics, the electronic control unit being a programmable computer, see column 2, lines 24-31, column 7, lines 20-23 and 42-54 and column 8, lines 17-35. Speller, Jr. et al. does not disclose the sensor operable to indicate a riveting force, a rivet feeder connected to the electronic control unit, a feed tube sensor wherein the rivet size is sensed by the sensor and an articulating robot attached to and positioning the riveting machine. However it is known to monitor a riveting force in a riveting process as attested by IBEC, see pages 4, 5 and 7. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have monitored the riveting force in Speller, Jr. et al.'s riveting process, in light of the teachings of IBEC, in order to provide appropriate riveting force to the joint

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being made. Applicant should note that it is within the general knowledge of one of ordinary skill in the art to use a sensor in monitoring the riveting force. Gast on the other hand teaches such rivet feeder and robot, see columns 13 and 14. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated a rivet feeder and an articulating robot to the system of Speller, Jr. et al./IBEC, in light of the teachings of Gast, in order to facilitate transfer of the rivet and enhance the rivet installation process.

12. Claims 49 and 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr./IBEC/Gast as applied to claim 48 above, and further in view of Cotterill et al.

For claim 49, Speller, Jr. et al./IBEC/Gast teaches a control system as shown above except for the rivet having a solid head and a diverging open end which does not completely penetrate a workpiece farthest from the head. However Cotterill et al. teaches such rivet, see figures 1-3. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the rivet of Cotterill et al, in Speller, Jr. et al./IBEC/Gast's control system in order to avoid unevenness in the thickness of the sheet material encapsulating the rivet.

For claim 49, Applicant should note that the joint quality is monitored in the IBEC monitoring system, see page 5 particularly. It would have been obvious to one of ordinary skill in the art at the time the invention was made that a good quality joint will require among other things the head of the rivet being essentially flush with the punch-side workpiece outer surface without completely piercing through the die-side

workpiece, see figure 15 of IBEC for example.

13. Claim 58 is rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al./Cotterill et al. as applied to claim 57 above, and further in view of the Affidavit of John Vrana (Vrana).

Speller, Jr. et al./Cotterill et al. discloses a system as shown above except for the plunger and the clamp movable together at a first speed during advancement, and the plunger is subsequently movable at a second speed slower than the first speed when the clamp is substantially stationary during rivet-to-workpiece engagement. However such system is known as attested by Vrana. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the system of Vrana with the system of Speller, Jr. et al./Cotterill et al., in order to ensure good quality joints.

14. Claim 62 is rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al./Cotterill et al. as applied to claim 56 above, and further in view of IBEC and Gast.

Speller, Jr. et al./Cotterill et al. discloses a system as shown above except for a sensor operable to detect at least one of clamp travel, plunger advancing force, clamp advancing force, etc, and a robotic arm coupled to the frame. However IBEC teaches a monitoring system to monitor the applied force during the riveting process, see pages 4, 5 and 7. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have used the monitoring system of IBEC in Speller, Jr. et al./Cotterill et al.'s electronic control system, in order to achieve superior rivet joints.

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Applicant should note that using a die always aligned with the punch is an obvious matter of design choice wherein no stated problem is solved or unexpected results obtained in using a die always aligned with the plunger versus the type taught by Speller, Jr. et al. Furthermore many of the prior arts made of record in the instant application disclose the combination of a substantially stationary die always aligned with a punch. Gast on the other hand teaches such robot, see columns 13 and 14. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated an articulating robot to the system of Speller, Jr. et al./Cotterill et al./IBEC, in light of the teachings of Gast, in order to enhance the rivet installation process.

15. Claims 63 and 71 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al. in view of Cotterill and Vrana.

Speller, Jr. et al. discloses an electronic control system for use in a riveting process, the system comprising a rivet and a riveting machine, an electronic control unit, an electric motor connected to the electronic control unit and sensors connected to the electronic control unit and the electric motor, the sensors indicating various characteristics of the electric motor and various riveting characteristics, the electronic control unit being a programmable computer, see column 2, lines 24-31, column 7, lines 20-23 and 42-54 and column 8, lines 17-35. Speller, Jr. et al. does not disclose the rivet as being a self-piercing rivet operably driven by a punch, and a die operably diverging an end of the rivet without the rivet piercing completely through the exterior surface of a die-side workpiece adjacent the die. However Cotterill et al. teaches such rivet, punch and die

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assembling, see column 2, lines 27-49 and figures 1-3. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made, to have incorporated the system of Speller, Jr. et al. with the rivet and die system of Cotterill et al., in order to improve the riveted joint produced. Although Speller, Jr./Cotterill et al. does not disclose a movable clamp connected to the transmission, the movable clamp and a member coupled to the transmission initially movable together at a first speed and the plunger movable at a second speed, however such arrangement is known as attested by Vrana. Therefore it would have been obvious to one of ordinary skill in the art at the time the invention was made to have used the system of Vrana with the system of Speller, Jr. et al./Cotterill et al., in order to ensure good quality joints.

16. Claims 64-70 and 71-77 are rejected under 35 U.S.C. 103(a) as being unpatentable over Speller, Jr. et al./Cotterill et al./Vrana as applied to claim 63 above, and further in view of IBEC.

IBEC has been discussed above. It is within the general knowledge of one of ordinary skill in the art to use appropriate sensors and monitoring units as outlined in the above rejections.

Allowable Subject Matter

17. Claims 1-11 are allowed.

18. Claims 13, 14 and 17 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

19. Applicant's arguments filed July 21, 2004 have been fully considered but they are not persuasive.

In response to Applicant's argument that there is no suggestion or motivation to combine the hydraulically actuated riveting machines such as IBEC with the electric motor actuated device of Speller, Jr. et al., the examiner respectfully disagrees in as much as Applicant's invention is directed to control systems which are not exclusive to electric motor actuated riveting machines. IBEC is used to show that it is known to use electrical control systems to control the riveting process. Whether a hydraulically actuated or an electric motor actuated device is used does not matter, the concept of using various sensors during the riveting process is not new. If Applicant believes the claimed control system is novel then Applicant should point out the differences between the known control systems and Applicant's.

In response to Applicant's argument that a fluid-free transmission is used in his invention, thus further highlighting the incompatibility and lack of suggestion and motivation to combine the hydraulic system of IBEC with the electric motor actuator of Speller, the examiner again points out that IBEC is pertinent to the problem Applicant was trying to solve, namely control system in riveting devices. Not only IBEC is analogous to Applicant's invention, but IBEC is very pertinent to the problem Applicant's was trying to solve. Applicant should note that it has been held that a prior art reference must either be in the field of Applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied

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upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992).

In response to Applicant's argument that the examiner has ignored the secondary consideration of commercial success, the examiner respectfully disagrees. The examiner has responded to those arguments in responses in Paper No. 8 mailed July 10, 2002.

In response to Applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

In view of the above remarks, the examiner maintains that a *prima facie* case of obviousness has been established in the instant application as outlined above in the rejections.

Conclusion

20. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

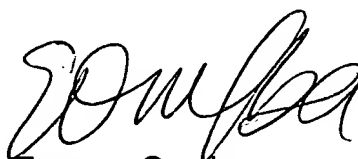
21. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Essama Omgba whose telephone number is (703) 305-2915. The examiner can normally be reached on M-F (10-7:30) First Friday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Peter Vo can be reached on (703) 308-1789. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Essama Omgba
Primary Examiner
Art Unit 3726

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November 15, 2004